Electronic TUBES

12FX8-A

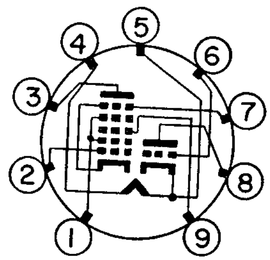
TRIODE—HEPTODE

DESCRIPTION AND RATING

The 12FX8-A is a miniature triode-heptode designed for use in automobile radio receiver service where plate and screen voltages are supplied directly from a 12-volt storage battery. The triode section is intended for RF amplifier use and the heptode section for frequency-converter use.

The 12FX8-A is unilaterally interchangeable with the 12FX8 and differs only in having an additional control on the conversion-conductance cutoff characteristic of the heptode section.

BASING DIAGRAM

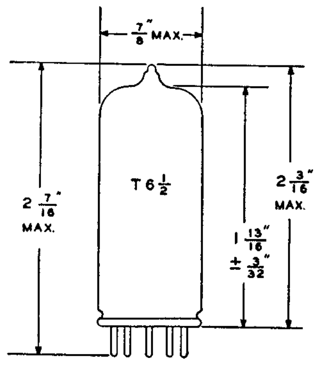


EIA 9KV

TERMINAL CONNECTIONS

Pin 1—Heptode Grid Numbers 2 and 4 (Screen)
Pin 2—Heptode Grid Number 1 (Oscillator Grid)
Pin 3—Heptode Plate
Pin 4—Heater
Pin 5—Heater and Triode Cathode
Pin 6—Triode Grid
Pin 7—Heptode Cathode, Grid Number 5, and Internal Shield
Pin 8—Triode Plate
Pin 9—Heptode Grid Number 3 (Signal Grid)

PHYSICAL DIMENSIONS



EIA 6-10

GENERAL

ELECTRICAL

Cathode—Coated Unipotential

Heater Voltage, AC or DC	12.6†	Volts
Heater Current	0.27	Amperes

Direct Interelectrode Capacitances‡

Heptode		
Grid-Number 3 to Plate: (Hg3 to Hp), maximum	0.28	μμf
Grid-Number 3 to Grid-Number 1: (Hg3 to Hg1), max.	0.12	μμf
RF Input: Hg3 to (h+Tk+Hk+Hg1+Hg2, 4+Hg5+Hp+i.s.)	6.0	μμf
Oscillator Input: Hg1 to (h+Tk+Hk+Hg2,4+Hg3+Hg5+Hp+i.s.)	5.0	μμf
Mixer Output: Hp to (h+Tk+Hk+Hg1+Hg2, 4+Hg3+Hg5+i.s.)	5.0	μμf
Grid-Number 1 to Cathode: Hg1 to (Hk+Hg5+i.s.)	3.0	μμf
Oscillator Output: Hk to (h+Tk+Hg2, 4+Hg3+Hp)	17	μμf
Grid-Number 1 to Plate: (Hg1 to Hp), maximum	0.16	μμf
Triode		
Grid to Plate: (Tg to Tp)	1.3	μμf
Input: Tg to (Tk+h)	2.2	μμf
Output: Tp to (Tk +h)	0.25	μμf
Triode Grid to Heptode Grid-Number 3: (Tg to Hg3), max.	0.01	μμf
Triode Plate to Heptode Grid-Number 3: (Tp to Hg3), max.	0.18	μμf
Triode Plate to Heptode Plate: (Tp to Hp), max.	0.20	μμf

MECHANICAL

Mounting Position—Any
Envelope—T-6½, Glass
Base—E9-1, Small Button 9-Pin

MAXIMUM RATINGS

DESIGN-CENTER VALUES

Heptode Plate Voltage	16	Volts
Heptode Screen-Supply Voltage	16	Volts
Heptode Screen Voltage	16	Volts
Heptode Positive DC Grid-Number 3 Voltage	0	Volts
Heptode Negative DC Grid-Number 3 Voltage	16	Volts
Triode Plate Voltage	16	Volts

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MAXIMUM RATINGS (Cont'd)

Heater-Cathode Voltage		
Heater Positive with Respect to Cathode	16	Volts
Heater Negative with Respect to Cathode	16	Volts
Heptode Grid-Number 3 Circuit Resistance	10	Megohms
Triode Grid-Circuit Resistance	10	Megohms

Design-Center ratings are limiting values of operating and environmental conditions applicable to a bogey tube of a specified type as defined by its published data, and should not be exceeded under normal conditions.

These values are chosen by the tube manufacturer to provide acceptable serviceability of the tube in average applications, taking responsibility for equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of all tubes.

The equipment manufacturer should design so that initially no design-center value for the intended service is exceeded with a bogey tube in equipment operating at the stated normal supply-voltage.

CHARACTERISTICS AND TYPICAL OPERATION

AVERAGE CHARACTERISTICS

	Heptode§	Triode	
Plate Voltage	12.6	12.6	Volts
Screen Voltage	12.6	—	Volts
Grid-Number 3 Voltage	0.5¶	—	Volts
Grid-Number 3 Resistance	2.2	—	Megohms
Grid-Number 1 Voltage, RMS	1.6	—	Volts
Grid-Number 1 Resistance	0.033	2.2	Megohms
Grid Voltage	—	0.8 #	Volts
Plate Resistance, approximate	0.5	—	Megohms
Conversion Transconductance	300	—	Micromhos
Transconductance	—	1400	Micromhos
Amplification Factor	—	10	
Plate Current	0.29	1.3	Milliamperes
Screen Current	1.25	—	Milliamperes
Grid-Number 3 Voltage, approximate			
Gc = 10 Micromhos	−3.0	—	Volts
Gc = 1.0 Micromho	−8.0	—	Volts
Grid Voltage, approximate			
Ib = 10 Microamperes	—	−3.2	Volts

HEPTODE OSCILLATOR CHARACTERISTICS (Not Oscillating)

Plate Voltage	12.6	Volts
Screen, Connected to Plate		
Grid-Number 3 Voltage	0	Volts
Grid-Number 1 Voltage	0	Volts
Amplification Factor§§	9	
Transconductance§§	3600	Micromhos
Cathode Current	4.4	Milliamperes
Grid-Number 1 Voltage, approximate		
Ib = 10 Microamperes	−4.5	Volts

† When used in automobile service from a 12-volt source, under no circumstances should the heater voltage be less than 10.0 volts or more than 15.9 volts. These extreme variations in heater voltage may be tolerated for short periods; however, operation at or near these absolute limits in heater voltage necessarily involves sacrifice in performance at low heater voltage and in life expectance at high heater voltage. Equipment reliability can be significantly increased with improved supply-voltage regulation.

‡ Without external shield.

§ Self-excited converter service.

¶ Voltage developed across 2.2 megohm grid-number 3 resistor.

Voltage developed across 2.2 megohm grid resistor.

§§ Between grid-number 1 and grids number 2 and 4 connected to plate.

ELECTRONIC COMPONENTS DIVISION

GENERAL ELECTRIC

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